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Impact Of Weather Conditions On Students' Behaviors And Readiness To Learn

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IMPACT OF WEATHER CONDITIONS ON STUDENTS' BEHAVIORS AND READINESS TO LEARN

HIRD

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Impact of Weather Conditions on Students' Behaviors and Readiness to Learn

(TITLE)

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Randy Hird

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Abstract

A study was conducted of the affect of weather conditions on the behavior and readiness to learn of students. This assessment was accomplished by collecting the weather data for twenty consecutive school days and comparing with an evaluation of student behavior and readiness to learn as measured by teachers in St. Joseph Grade School.

The data were analyzed by studying the effect of barometric pressure and the presence or absence of precipitation on a given day. The students were also categorized by gender and age to see if the climatic conditions significantly impacted their behaviors and readiness to learn.

The students were selected randomly from grades K-8. The evaluation of the climatic conditions and the students' behaviors and readiness to learn took place from March 1, 1993 to April 2, 1993.

Although a thorough review of recent literature indicated that there was evidence linking weather conditions to behaviors, the findings of this study did not show a significant difference between the climatic conditions and the behaviors or readiness to learn of students.

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Chapter 1

Overview

Introduction and the Problem

The issue of how to improve student learning has been debated at great length by a variety of individuals, with many different philosophies, agendas, and answers being expressed. In the researcher's opinion, a student's readiness to learn is keystone to improving student learning. Although this point is simple, the ramifications are complex.

This study acknowledges that there are many factors involved in a student's readiness to learn such as: (a) home environment, (b) school environment, (c) student aptitude, (d) teacher expertise, and (e) parental involvement. The researcher recognizes the importance of these factors, but believes that one area often not studied regarding readiness to learn is the role that climatic conditions play upon student learning. While the role which climatic conditions play is often discussed by teachers, the researcher was unable to locate empirical studies which proved or disproved this theory.

It is the researcher's opinion that teachers' perceptions have, in most part, held to the time honored belief that all students are affected by weather. Though this belief has neither been proved or disproved empirically, in the researcher's opinion, this has not changed the opinion of teachers that the weather is a major

factor in student readiness to learn and behavior. This opinion cuts to the heart of the problem addressed by this study. The problem is, "Do certain weather conditions, such as barometric pressure, temperature, humidity, wind, and precipitation; influence the performance of students behaviorally and their readiness to learn as measured by teachers' perceptions?"

Assumptions

It is assumed that the students sampled constitute a representative cross section of the entire student body. It is also assumed that the responses tallied from the teachers were accurate, unbiased, and sincere. The collection of weather data were compiled from hourly weather reports compiled from the WCIA news room. These reports were developed by the National Weather Service out of Chicago, Illinois, and were sent directly to the news room at WCIA. Mike Sola, a member of the weather broadcasters of WCIA, has consented to collect the hourly reports. It is assumed that these data were accurate and fairly represent the actual weather conditions in this location.

Limitations

The first limitation is that this study took place in the late winter and early spring of the year. This is a limitation because the researcher would have preferred to use the fall due to the sudden changes in the climatic conditions. The second limitation is due to the time

constraints of this report. In order to analyze the data, a longitudinal study of three to five years would yield data that would be more accurate. The last limitation is that this study only used students from St. Joseph District #169 in the location of St. Joseph, Illinois.

Operational Definitions

Climatic conditions. This study will use five weather conditions to describe climatic conditions barometric pressure, temperature, humidity, wind, and precipitation.

Barometric pressure. A measure of atmospheric pressure, which is the pressure exerted by the atmosphere, not only downward but in all directions (Hechtlinger, 1959).

Temperature. The intensity of heat, as measured by a thermometer (Hechtlinger, 1959).

Humidity. The water vapor content of the air, given in grams per cubic centimeter (Hechtlinger, 1959).

Winds. A natural air current resulting from pressure differences (Hechtlinger, 1959).

Precipitation. Moisture falling from the clouds or separating from air, such as rain, snow, sleet, hail, fog, frost, dew (Hechtlinger, 1959)

Teacher Survey of Academic and Behavioral Performance (TSABP). An instrument developed by this study, utilized to collect data on selected students in the areas of; readiness to learn, cooperative attitude, appropriate behavior, and academic achievement.

Weather Data. Weather data is the actual information collected by this study on the weather conditions in the St. Joseph area during the time frame of this research. The combination of all climatic conditions.

Readiness to Learn. A concept that is a combination of the physical (alertness), cognitive (stay on task), social (work well with others), and motivational (inward desire), that will be measured by the teacher survey.

Uniqueness of this Study

The concept of measuring the significance of climatic conditions upon academic as well as behavioral conditions has not been studied in the St. Joseph School District, the greater Champaign-Urbana metropolitan area or even the state of Illinois.

As previously mentioned, the readiness of the student to learn is of paramount importance. In the past, research has examined a number of factors involved with student readiness such as, environmental situations, economic status, and teacher effectiveness. This study looked at an entirely new direction which is the factor of climatic conditions and their effect upon the student's readiness to learn and behavior. There are comparisons made between age groups, and gender groups in order to ascertain if there is a more significant difference in one group or another. Finally, this report sought information linking behavioral and academic performance in individual students.

While, in the opinion of the researcher, many teachers intuitively believe that climatic conditions significantly impact students' readiness to learn and behavior, there is minimal empirical research to support or refute teachers' intuitive judgment.

Chapter II

Rationale, Related Literature and Research

Rationale

Educators are constantly searching for ways and means to improve how they meet the needs of students in areas such as academic, social, emotional, physical, and even moral development. By attempting to meet these needs, educators look at the situations that affect the student such as family make-up, socio-economic situation, personality of the student, and the potential academic skills of the student. The aforementioned are assumed to be correlates of effective student learning. Climatic conditions are less accepted at the present time.

Based on the above rationale, this study proposes the concept that an important influential factor that has not received enough attention is the effect of the climatic conditions upon the performance of the student both academically and behaviorally. It is often assumed that people feel better when the weather conditions are favorable such as a warm sunny day in the spring or even a nice cool evening in the summer. In fact SAD (Seasonal Affective Disorder) is recognized by the medical community. The definition of SAD is:

> "A mood disorder associated with the shorter days and longer nights of autumn and winter. Symptoms include lethargy, depression, social withdrawal and work difficulties. The condition is associated with the

effect of light on melatonin secretion and is treated with exposure to bright lights for 5 to 6 hours per day" (Mosby's, 1990, p. 1060).

Bauer (1992) states that, "Current data indicate that seasonal variation of mood and energy is widespread throughout the general population" (p. 1187). Bauer also states that, "In fact, there is evidence that most persons have some degree of mood and energy change with changing seasons" (p. 1186).

If the weather conditions were more subtle, but still very real such as a rising or sinking barometric pressure or the passing of a front, then is a person's behavior likely to be impacted? If the presence of sunshine changes the attitude of a person, then it is likely that other climatic conditions such as changing of the barometric pressure would impact a person's attitude? If there are significant changes in a student's performance due to climatic conditions, then school personnel will know one more link in this process of educating their students.

Review of Literature and Research

The concept that weather conditions have an effect upon the behavior and achievement of a person is not a new idea. The Greek physician, Hippocrates, considered the medical consequences of various winds important in the study of medicine. He maintained that hot and cold winds have a bearing on the outbreak and course of disease (Boris, 1981).

During the New England hurricanes of 1938, students at Massachusetts State College, who were taking standardized tests during the passage of the hurricane; scored 20 points above the usual performance for that college. One researcher was quoted as observing, "We can't rush to proclaim that hurricanes raise intelligence. Such a natural coincidence has never been repeated. Yet we should not discount the power of abnormal weather conditions to affect mental performance" (Boris, 1981, p. 2).

There has been limited research on the effects of weather conditions influencing human behavior in some areas outside of education. One area that has been carefully studied is the link between weather conditions and traffic accidents. The obvious concentration was the physical conditions, such as ice, water, or windy situations, and the anticipated rise in accidents. However, one researcher, concluded that "there is evidence that physical considerations alone are insufficient" (Smith, 1982, p.90). Smith describes sharp rises in accident rates which have been associated with the passages of fronts. In turn these effects are seen as causing "biological unfavorable stresses operating on the central nervous system" (Smith, 1982, p.90).

Two other studies (Mueller, 1975; and Winstanley, 1972) examined the winds of two areas, Santa Ana, California, and the coast of North Africa, respectively. In both studies the researchers found a relationship

between the weather condition and human behavior. In Santa Ana there was a significant relationship between the wind conditions and the rise in crime. In Africa there was impact upon physiological and psychological stresses as related to hot weather and then the passage of a cold front (Badger, 1989).

There have been other studies with suicide statistics that do not bear out a relationship between weather conditions and human behavior. In four different studies from Houston, Texas; Philadelphia, Pennsylvania; North Carolina; and the Netherlands, no association was found between the suicide rates and the average temperature by month (Lester, 1986). However, in a reanalysis Lester (1973) found significant correlations for two of the cities.

Not all of the research on this subject is outside of the parameters of education. Several studies will be discussed below, all of which are related to the effects of weather and climatic conditions upon different aspects of the education of the student. Each study focused upon different weather conditions and effects; however, the common thread is the fact that there were significant changes in the behaviors of the students due to climatic changes.

Vachon (1983), attempted to verify three objectives: (a) whether a relationship can be established between children's behavior and atmospheric conditions, (b)

whether a relationship can be established between school children's behavior and the day of the week, and (c) the reliability of the undergraduates in collecting the research data (Vachon, 1983).

Vachon found that the higher the air pressure and the greater sunshine hours in a day, the quieter the children. However, increased humidity caused the children to be more active. Vachon also found that the children were significantly quieter on Mondays than on Fridays.

A second study was conducted at North Branch, New Jersey, which was directed at establishing the correlation between air pressure and the adverse behavior in children. Barometric pressure was considered the prime factor, since its change is affected directly by changes in temperature and humidity (Scagliotta, 1980).

In the North Branch, New Jersey, study; 127 students were observed. Their ages varied from 9-13 and their IQs from 78-106. These students were selected on the basis of their history of adverse behavior disturbances, hyperactivity, irritability, distractibility, and impulsivity. The results were inconclusive. Actual observations revealed many situations with ideal weather conditions, in which there was adequate sunlight, pleasant temperatures, and no precipitation. However, students' behavioral performances were unacceptable. Some days with dismal weather conditions actually had acceptable behaviors. The researchers then observed during the

experiment that what was not taken into account was the fact that even with good weather conditions there could be a falling barometer, which affected the behavior more than the outside conditions. In the opinion of Scagliotta, (1980) "a definite relationship exists between decreasing atmospheric pressure and maladaptive behavior in children. In actuality the falling barometer had indeed resulted in failing behavior" (p.611).

The final study cited was performed at the West Cumbria Secondary School in England. In this study students were sent to a quiet room when any situation arose that could lead to a confrontational problem. The frequency of these quiet room incidents was recorded and analyzed using several weather conditions that were present on given days in order to determine the correlation. The weather conditions used were wind direction, wind speed, dew point, maximum temperature, minimum temperature, and rainfall (Badger, 1989).

The study lasted for one school year. There were 26.4 referrals to the quiet room per week. There was a maximum of 18 incidents in one day, and a minimum of zero incidents in a day, of which there were nine days. The results indicated a statistically significant positive relationship at the 0.08 level, between the number of disruptive incidents and temperature measures and disruptive incidents and wind speed. This level of statistical significance was

not reached in the correlations between the number of disruptive incidents and rainfall (Badger, 1989).

There is evidence that a positive relationship exists between climatic conditions and behaviors of students. This study will focus on determining the relationship between climatic conditions in the form of barometric pressure, fronts, precipitation, temperature, and humidity and student behavior in the form of readiness to learn and disruptive behavior.

Chapter III

Design of the Study

This study focuses on the following questions in order to determine if there is a significant difference between climatic conditions and student academic readiness to learn and behavior.

Question 1. Do climatic conditions affect the academic readiness to learn of students?

Question 2. Do climatic conditions affect the behavior of students?

Question 3. Do climatic conditions have a significantly different impact by gender for readiness to learn?

Question 4. Do climatic conditions have a significantly different impact by gender for behavior?

Question 5. Are climatic conditions more likely to affect older or younger students more significantly in readiness to learn?

Question 6. Are climatic conditions more likely to affect older or younger students more significantly in behavior.

The dependant variable was the students' behavior and readiness to learn. The independent variable was the climatic conditions, which were partitioned into three categories; days with 30.00 barometric pressure or higher, and no precipitation, days with barometric pressure less

that 30.00 and precipitation present, and other days that do not fall into the first two categories.

Sample and Population

The site of this study is St. Joseph Elementary District #169, located in St. Joseph, Illinois. St. Joseph has 648 students enrolled in grades K-8. There are three sections of each grade level except for the third grade in which there are four. The average class size is 25.

One teacher was selected from each grade level due to their willingness to cooperate in this project. This study used stratified random sampling for students and classrooms of the participating teacher. It is assumed that this sampling was representative of the entire student body.

The teachers selected divided their class into three sections: high achievers, average achievers, and low achievers. This division was based on the students' scores on norm referenced achievement tests, grades for the first two marking periods, and teacher evaluation of the students' general academic ability. The teachers then randomly selected one boy and one girl from each of the three divisions by placing names in a container and drawing until they selected one boy and one girl.

When this process was completed, the sample contained 54 students--27 boys, and 27 girls--which reflected 8.33% of the total student population. There were also nine students in each category: high achieving boys, high achieving girls, average achieving boys, average achieving

girls, low achieving boys, and low achieving girls. Finally, there was also an even distribution of students in grade levels from kindergarten to eighth grade. This information is also presented as Table 1.

Table 1

Descriptive Information About the Sample

		Academic Levels					
		High		Average		Low	
Grade	No. of Students	Girls	Boys	Girls	Boys	Girls	Boys
K	65	1	1	1	1	1	1
1	64	1	1	1	1	1	1
2	67	1	1	1	1	1	1
3	84	1	1	1	1	1	1
4	64	1	1	1	1	1	1
5	79	1	1	1	1	1	1
6	73	1	1	1	1	1	1
7	78	1	1	1	1	1	1
8	74	1	1	1	1	1	1
Totals	648	9	9	9	9	9	9

Data Collection and Instrumentation

Each teacher utilized a copy of the Teacher Survey of Academic and Behavioral Performance (TSABP) which was completed for each student over a four week period of time. The TSABP was developed by the researcher in order for the teachers to be able to collect data in a reasonable amount of time. The instrument is simply a chart in which the teachers are able to make short evaluations of individual student readiness to learn and behaviors as well as making judgments for the readiness to learn and behavior of the entire class. (See Appendix A) Along with the instrument, each teacher received an explanation of the study and directions for filling out this evaluation. The judgments are subjective, however, each teacher received the same instructions in order for the evaluations to be as consistent as possible. (See Appendix B)

The observations took place over a four week period which began Monday, March 8, 1993, and ended Friday, April 2, 1993. This period reflected 20 days of student attendance with only one interruption which is a half day inservice on March 18, 1993.

During this time period, each teacher evaluated the selected six students on AM behavior, PM behavior, AM readiness to learn, PM readiness to learn, and the overall readiness of the entire class. This evaluation was completed using the numerical scale of 1-10 on the TSABP, with 1 being extremely poor and 10 being outstanding.

During this same four week period, the researcher collected weather data from the local television news, Channel 3 WCIA. The collection was completed by Mr. Mike Sola, a weather broadcaster from Channel 3 News, by retaining the hourly reports sent to them by the National Weather Service out of Chicago, Illinois. The data collected were, barometric pressure, temperature, humidity, precipitation, and wind.

Data Analysis

Analysis of variance was used to test for significant difference between the means of groups for each question.

Chapter IV

Results and Conclusions

Data Analysis

This section presents the data analysis referenced to each of the research questions.

Data Analysis of Question 1

Question 1 was: Do climatic conditions affect the academic readiness of students? The analysis of the results was accomplished by dividing the twenty days into three categories: (a) days in which the barometric pressure is above 30.00 and there is no precipitation, (b) days in which the barometric pressure is less that 30.00 and there is precipitation present, and (c) all other days that do not fall into category 1 or 2. After the twenty days were divided into the three categories, the students' readiness-to-learn scores were computed in order to arrive at the mean score for each of the three categories. These scores were taken from the Teacher Survey of Academic and Behavioral Performances completed by each teacher. An analysis of variance was used to see if there was a significant statistical difference between the means of the three categories.

Table 2 presents the analysis of variance result for research question 1. The analysis of variance compared the mean rating of readiness-to-learn for the three weather

condition categories. In Table 2, the scores of all students in the study were used.

Table 2

Results for Question 1

Category		N	Mean
Category 1	Barometric pressure 30.00 or above; no precipitation	54	8.44
Category 2	Barometric pressure less than 30.00; precipitation present	54	8.44
Category 3	Other days that do not fall into Category 1 or 2	54	8.38

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.06	.94
Within Groups	159		
Total	161		

Results. The data show no significant difference between the means of the three categories. This indicates

that, based on the perception of teachers at St. Joseph Grade School, weather conditions did not have a significant impact on readiness-to-learn of students.

Data Analysis of Question 2

Question 2 was: Do climatic conditions affect the behavior of students? The analysis of this question used the same three categories from the previous question in order to compare the means of the students' behavior for the twenty days. An analysis of variance was used in order to see if a significant statistical difference exists between the means of the three categories.

Table 3 presents the analysis of variance result comparing the mean rating of behavior for the three weather condition categories. The scores of all students were used in Table 3.

Table 3

Results for Question 2

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	54	8.92
Category 2	Barometric Pressure Less than 30.00; Precipitation Present	54	9.03
Category 3	Other days that do not fall into Category 1 or 2	54	8.97

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.11	.90
Within Groups	159		
Total	161		

Results. The data show no significant difference between the means of the three categories. This indicates that based on the perception of teachers from St. Joseph Grade School, weather conditions did not have a significant impact upon the behavior of students.

Data Analysis of Question 3

Question 3 was: Do climatic conditions have significantly different impact by gender for readiness to learn? This question was analyzed by using the same three categories of weather conditions and then by dividing the students by gender. Table 4 represents the analysis of variance results for the boys. Table 5 represents the analysis of variance results for the girls.

Table 4

Results for Question 3

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	27	8.24
Category 2	Barometric Pressure Less than 30.00; Precipitation present	27	8.20
Category 3	Other days that do not fall into Category 1 or 2	27	8.14

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.03	.97
Within Group	81		
Total	83		

Table 5

Results for Question 3

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	27	8.65
Category 2	Barometric Pressure Less than 30.00; Precipitation present	27	8.69
Category 3	Other days that do not fall into Category 1 or 2	27	8.59

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.03	.97
Within Group	75		
Total	77		

Results. The data show no significant difference for either boys or girls in readiness to learn. This means that, based on the perception of teachers at St. Joseph Grade School, weather conditions did not have a significant

impact on either boys or girls regarding the readiness-to-learn.

Data Analysis of Question 4

Question 4 was: Do climatic conditions have a significantly different impact by gender for behavior? This question was analyzed using the same three categories from the previous questions and then computing the mean scores by gender for the behavior score of each student. Table 6 represents the analysis of variance for the boys and Table 7 represents the analysis of variance for the girls.

Table 6

Results for Question 4

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	27	8.59
Category 2	Barometric Pressure Less than 30.00; Precipitation present	27	8.75
Category 3	Other days that do not fall into Category 1 or 2	27	8.65

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.12	.89
Within Groups	81		
Total	83		

Table 7

Results for Question 4

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	27	9.28
Category 2	Barometric Pressure Less than 30.00; Precipitation present	27	9.33
Category 3	Other days that do not fall into Category 1 or 2	27	9.31

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.02	.98
Within Groups	75		
Total	77		

Results. The data show that there is no significant difference in the behavior means when comparing boys and girls. This means that based on the perception of teachers at St. Joseph Grade School, weather conditions did not have an impact upon the behavior of the students by gender.

Data Analysis of Question 5

Question 5 was: Are climatic conditions more likely to effect older or younger students more significantly in readiness-to-learn. This question was analyzed using the three categories of weather conditions used in the previous questions. Then the students were divided by grade levels, comparing the students in grades K-4 (Table 8) with the students in grades 5-8 (Table 9) using their readiness-to-learn scores from the TSABP filled out by the teachers.

Tables 8 and 9 present an analysis of variance results comparing the mean rating of readiness-to-learn for three weather condition categories. Table 8 presents the data from students in grades K-4, and Table 9 presents the data from students grades 5-8.

Table 8

Results for Question 5

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	30	8.21
Category 2	Barometric Pressure Less than 30.00; Precipitation present	30	8.31
Category 3	Other days that not fall into Category 1 or 2	30	8.21

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.04	.96
Within Groups	87		
Total	89		

Table 9

Results for Question 5

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	24	8.73
Category 2	Barometric Pressure Less than 30.00; Precipitation present	24	8.60
Category 3	Other days that do not fall into Category 1 or 2	24	8.54

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.12	.88
Within Groups	69		
Total	71		

Results. The data show no significant difference between the age groups for readiness-to-learn. This indicates that, based on the perception of teachers at St. Joseph Grade School, weather conditions did not have a

significant impact on the readiness to learn for different age groups.

Data Analysis of Question 6

Question 6 was: Are climatic conditions more likely to effect the older or younger students more significantly in behavior? This question was analyzed using the three weather condition groups previously listed and then comparing the students in grades K-4 (Table 10) with the students in grades 5-8 (Table 11) concerning their behavior score from the TSABP as evaluated by the teachers.

Tables 10 and 11 present an analysis of variance results comparing the mean rating of behavior for three weather condition categories. Table 10 presents the data from students in grades K-4, and Table 11 presents the data from student in grades 5-8.

Table 10

Results for Question 6

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	30	8.85
Category 2	Barometric Pressure Less than 30.00; Precipitation present	30	9.01
Category 3	Other days that do not fall into Category 1 or 2	30	8.82

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.17	.84
Within Groups	87		
Total	89		

Table 11

Results for Question 6

Category		N	Mean
Category 1	Barometric Pressure 30.00 or higher; No precipitation	24	9.01
Category 2	Barometric Pressure Less than 30.00; Precipitation present	24	9.06
Category 3	Other days that do no fall into Category 1 or 2	24	9.15

Source of Variance	Degrees of Freedom	F Ratio	Probability Level
Between Groups	2	.10	.91
Within Groups	69		
Total	71		

Results. The data show that there is not significant difference in the behavior of older or younger students. This indicates that, based on the perception of teachers at St. Joseph Grade School, weather conditions did not have a

significant impact upon the behavior of the students by age.

Chapter V

Summary, Findings, and Recommendations

Summary

This study focused on determining if climatic conditions significantly impacted the behavior and readiness to learn of students in grades K-8. Six students were chosen at random from the nine different grade levels. These students were evaluated by their teacher for twenty days concerning their behavior and readiness to learn. These evaluations were kept on an instrument entitled Teacher Survey of Academic and Behavioral Performance (TSABP).

During the twenty days that the students were evaluated, two different climatic conditions were documented. The two conditions were: a. barometric pressure, b. precipitation. In order to make comparisons the researcher chose three categories: a. days in which the barometric pressure was 30.00 or higher, with no precipitation, b. days in which the barometric pressure was less than 30.00, and there was precipitation, and c. other days that do not fall into categories 1 or 2.

Findings

In reviewing the data from the TSABP and using the mean scores, an analysis of variance was used to see if a

significant statistical difference was present. In all six research questions concerning behavior and readiness to learn, no significant difference occurred. This indicated that, based on the perception of the teachers of St. Joseph Grade School, weather does not significantly impact the behavior or readiness to learn of a student.

Recommendations

After analyzing the data from this study, the primary recommendation is to present the findings to the staff at St. Joseph Grade School. According to the perceptions of the staff, there is not a significant impact of the climatic conditions on the behavior and readiness to learn of students.

This information is important because of the biases that have been indicated in this study. In the researcher's opinion, the staff continues to believe that the climatic conditions affect student performances. By sharing the results of this study, teachers will be able to insure that their biases do not interfere with the educational process.

Other recommendations include, grouping the data differently, using other weather conditions, and lengthening the timelines of the study.

The data that has been collected could be grouped to study high achievers versus low achievers. It is possible that there is a significant impact in one of these groups. This study only used barometric pressure and precipitation;

however, temperature, humidity, and wind information was also collected. Further study could include one or all of these other weather conditions. Finally, this study could be lengthened over a semester or even a school year.

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Appendix A
Teacher Survey of Academic and Behavioral Performance

Student's Name _____ Teacher _____ Grade _____

Date	AM Behavior	PM Behavior	AM R-T-L	PM R-T-L	TOTAL SCORE
3/8					
3/9					
3/10					
3/11					
3/12					
3/15					
3/16					
3/17					
3/18					
3/19					
3/22					
3/23					
3/24					
3/25					
3/26					
3/29					
3/30					
3/31					
4/1					
4/2					
Totals					

Appendix B
Explanation For Completing The TSABP Instrument

To: Teachers involved in climatic research
From: R. Hird
Re: Explanation of study and evaluation instrument

This spring I am collecting data on the relationship between climatic conditions and student readiness to learn and student behavior. During the four week period of March 8, 1993, to April 2, 1993, I will be collecting climatic conditions of barometric pressure, humidity, temperature, precipitation, and wind. During that same period of time you are to fill out the accompanying evaluation instrument named, Teacher Survey of Academic and Behavioral Performance (TSABP). After this period is completed and all of the data has been collected, I will analyze the data in order to see if there is a significant difference in the students' behavior and readiness to learn on particular days due to the climatic conditions.

We will divide your class into three groups; high achievers, average achievers, and low achievers. Then we will randomly select one boy and one girl from each group by picking names out of a hat. We will select until we get one boy and one girl from each category.

Your directions are to fill out one sheet for each of the six students that have been selected, and also fill one sheet out for your entire class as a summary of the AM and PM. Use the numerical scale of 1-10 with 1 being very low and 10 being very high. You will also note that the instrument indicates the AM and PM readiness to learn and behavior. Please select an appropriate AM time and then PM time so that you are consistently filling out the chart each day. Finally, if there are any events that are peculiar to that student behavior or readiness to learn, such as a severe behavioral problem, please make a small note on that day. Thank you for your cooperation in this study.